

Transformer Oil Containment Risk Assessment

SWPA / SPRA / USACE
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**US Army Corps
of Engineers**



Project Timeline

- Team Formed - June 2006
- Mission Statement & Questionnaire
- First Meeting Eufaula - Sept 2006
- Second Meeting Table Rock - Dec 2006
- Final SPCC Rule - Dec 2006
- Question Weighting - Jan 2007
- Matrix Development
- Preliminary Results - April 2007



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Mission Statement

A joint working group of Southwestern Power Resources Association, the United States Department of Energy's Southwestern Power Administration (Southwestern) and the United States Army Corps of Engineers (Corps) tasked to develop a system wide response to the issue of secondary containment of oil for transformers in service at Corps powerhouses and dam switchyards within Southwestern's marketing area. The work group will prioritize secondary containment based on environmental risk and operational assessment then identify containment solutions based on best practices at a reasonable cost. **This effort will also serve as a pilot activity for future system wide asset management upgrade/replacement decisions.**



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Scope

- 397,000 Gallons of Oil
- 69 Transformers
- 26 Locations
- 24 Hydro Power Facilities
- 6 USACE Districts



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Questionnaire – 64 Questions

- Five Categories
 - Site Information
 - Utilization/Load Information
 - Transformer Information
 - Oil information
 - Site Topography & Environmental Information



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Results by Rank & Risk Score

Rank	Site	Risk Score		Rank	Site	Risk Score
1	Bull Shoals	28.6		14	Keystone	12.0
2	Denison	18.9		15	Ozark	11.9
3	Eufaula DT Deck	17.1		16	Harry S. Truman	11.8
4	Beaver	15.7		17	Dardanelle	11.4
5	Norfork	15.3		18	Eufaula SwtchYd	11.0
6	Robert S. Kerr	14.2		19	Webbers Falls	10.0
7	Narrows	14.0		20	Clarence Cannon Deck	9.5
8	Blakely Mountain	13.8		21	DeGray	9.5
9	Greers Ferry	13.7		22	Sam Rayburn	9.2
10	Broken Bow	13.2		23	Stockton	9.0
11	Tenkiller	13.0		24	Clarence Cannon SwYd	5.5
12	Fort Gibson	12.9		25	Whitney	5.5
13	Table Rock	12.8		26	Robert D. Willis	4.0



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Preliminary Results by Need

Rank	Site	Risk Score	Rank	Site	Risk Score
7	Narrows	14.0	18	Eufaula SwYd	11.0
8	Blakely Mountain	13.8	19	Webbers Falls	10.0
16	Harry S. Truman	11.8	1	Bull Shoals	28.6
20	Clarence Cannon Deck	9.5	4	Beaver	15.7
21	DeGray	9.5	5	Norfork	15.3
23	Stockton	9.0	9	Greers Ferry	13.7
2	Denison	18.9	13	Table Rock	12.8
3	Eufaula DT Deck	17.1	15	Ozark	11.9
6	Robert S. Kerr	14.2	17	Dardanelle	11.4
10	Broken Bow	13.2	24	Clarence Cannon SwYd	5.5
11	Tenkiller	13.0	22	Sam Rayburn	9.2
12	Fort Gibson	12.9	25	Whitney	5.5
14	Keystone	12.0	26	Robert D. Willis	4.0
SPCC & Containment		Containment	SPCC		Good



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Recommendations

- Update all site SPCC plans to include signature by P.E. ASAP in accordance to the current SPCC Regulations without written commitment and Spill Contingency Plan.
 - Six purples turn blue and eight yellows turn green



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Visual of Recommendations

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Rank	Site	Risk Score	Rank	Site	Risk Score
2	Denison	18.9	8	Blakely Mountain	13.8
3	Eufaula DT Deck	17.1	21	DeGray	9.5
6	Robert S. Kerr	14.2	1	Bull Shoals	28.6
7	Narrows	14.0	4	Beaver	15.7
10	Broken Bow	13.2	5	Norfork	15.3
11	Tenkiller	13.0	9	Greers Ferry	13.7
12	Fort Gibson	12.9	13	Table Rock	12.8
14	Keystone	12.0	15	Ozark	11.9
16	Harry S. Truman	11.8	17	Dardanelle	11.4
18	Eufaula SwYd	11.0	22	Sam Rayburn	9.2
19	Webbers Falls	10.0	24	Clarence Cannon SwYd	5.5
20	Clarence Cannon Deck	9.5	25	Whitney	5.5
23	Stockton	9.0	26	Robert D. Willis	4.0
Containment			Good		



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Recommendations

- Complete Customer funded containment on Blakely Mountain and DeGray.
 - Two blues turn green



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Visual of Recommendations

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Rank	Site	Risk Score	Rank	Site	Risk Score
2	Denison	18.9	1	Bull Shoals	28.6
3	Eufaula DT Deck	17.1	4	Beaver	15.7
6	Robert S. Kerr	14.2	5	Norfork	15.3
7	Narrows	14.0	8	Blakely Mountain	13.8
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Containment			Good		



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Recommendations

- Estimate containment costs at remaining sites.
- Develop 5 year plan using criteria i.e. cost, transformer age, water cooled oil, utilization factor, environmental risk etc.
- Add containment according to plan and use written commitment where secondary containment is not feasible.



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5 Year Plan

- The five-year plan was established to:
 - Implement transformer oil containment where practical
 - Identify sites where transformer replacement/relocation should be considered



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5 YEAR PLAN

Year (FY)	Site	Cost Estimate	Annual Budget Estimate
2008	Narrows	\$ 350,000	\$ 350,000
2009	Broken Bow	\$ 400,000	\$ 800,000
	Tenkiller	\$ 400,000	
2010	Fort Gibson	\$ 400,000	\$ 800,000
	Harry S. Truman	\$ 400,000	
2011	Keystone	\$ 450,000	\$ 850,000
	Stockton	\$ 400,000	
Other	Denison	\$ 1,100,000	\$ 2,500,000
	Eufaula DT Deck	\$ 350,000	
	Eufaula Switchyard	\$ 100,000	
	Robert S. Kerr	\$ 600,000	
	Webbers Falls	\$ 350,000	
O&M	Clarence Cannon Deck	\$ 1,000	\$ 1,000
	Total:		\$ 5,301,000



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Questions ?????



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